Glide Submarine Driven by multimedia

Technical Field

The invention relates to a new submarine driven by multimedia.

Background Art

According to power system provided, submarine is divided into nuclear-powered submarine, combined diesel oil-electrical powered submarine, and fuel-battery powered submarine. A common feature of these kinds of submarines is that they have to be equipped with energy source and power system which could not be regenerated, does use propeller drive, and can't be driven manually.

Chinese patent application **ZL**011100006.6 (entitled "glide submarine" filed by the same applicant) disclosed a glide submarine controlled and driven manually and changes the gravity and the buoyance to power for advancing reciprocally. Said submarine is driven by glide wing or propeller underwater and by sail or propeller over water. The glide submarine comprises The submarine comprises a high pressure resistant vessel body, a wing, an elevator, elevating water bags, a water tank, a elevating rudder, a vertical tail plane, a foot-operated propeller power system, and a foot-operated draining plunger cylinder system etc.. The submarine is driven by wing and propeller in over water condition. When

in under water operation condition, the gravity of the submarine is changed to cause submarine to buoy or submerge, and the changing of gravity and buoyance is changed to power for advancing through wing.

Since said submarine works in oxygen-free and high-pressure environment, it can not realize necessary oxygen regenerating cycle. Due to movement under water only manually, said submarine can not stay and move under water for a long time and it can carry only a few persons.

Since such submarine is changed from a gliding downwardly condition to a gliding upwardly condition by manual draining, the submerging depth is defined by the draining pressure obtained by manual draining. When the draining pressure is smaller than the outer pressure, water can not be drained manually. The foot treading force is less than 100 kg during long time work. When the inner area of the draining valve of the water tank is 5 cm square (for ensuring the draining mount to ensure the work of submarine), 100 kg foot treading force produces pressure o 20 kg/cm square. That is, the maximum submerging depth of the submarine is less than 200 m in terms of theory.

The nowaday submarine has to be returned to parent port to be supplemented with fuel etc. or by other manner whether its property is advance, the moving radius and distance are limited.

Disclosure of the Invention

The object of the invention is to provide a new glide submarine, which has both underwater and overwater working performances, is mainly powered by means of wind energy resource (reusable and rich in the sea), and is driven by three media, i.e. glide, sail, propeller. That is, it can be controlled and driven by machinery (wind energy generator, combined diesel oil-electrical power, fuel battery and so on) or manually, and it can be driven underwater by glide wing or propeller, and can be driven over water by sail or propeller. Moreover, it possesses excellent capability of oceangoing voyage and deeper submerging depth.

For realizing the object of the invention, the invention provided a submarine driven by multimedia. The submarine comprises a high pressure resistant vessel body, a multi-function sail wing, an elevator, a vertical plane, an internal combustion engine, an electricity generator, a wind power generator, a high energy storage battery, a fuel battery, a foot-operated propeller power system, a submarine elevating controlling system, an inside water tank, two outer elevating water-air bags of changeable stream-linear mode, a sail wing controlling system, and a life maintaining system, a communication system and GPS (global positioning system), and an acoustic susceptance system (sonar system) etc.. The working principle of the submarine of the invention is as follows: the inside water tank, the outer elevating water-air bag of changeable stream-linear mode, the water pump, the foot-operated drainage plunger cylinder and the corresponding connecting valves form a closed system connected by corresponding manifold, forming an elevating controlling system of submarine. The outer elevating water-air bag of changeable stream-linear mode is made of soft material with high strength and elasticity and arranged at both sides of the bottom of vessel body symmetrically. When submarine is over water, water or air is filled fully within the water bag. At the present time submarine likes a three body vessel traveled on water surface, having better stability and streamline pattern. At this time the submarine either can be driven by multi-function

sail wing or by internal combustion engine. Then, the connecting valve connected with water tank inside vessel is opened. Because of in normal condition the pressure of the water in the outer water bags is always higher than the pressure of inside water tank, at this time, the water in the outer water bags flows into the inside water tank to cause the outer water bags to be contracted, the draining volume of the submarine to be reduced gradually, and the submarine to sink down gradually. When the draining volume of the submarine reduces to a certain degree, the specific gravity of the vessel body is larger than that of water, and the submarine can sink down. At this time the connection valve is closed, the operating rod of elevator is activated, and the angle of elevator is adjusted, the gravity for sinking will be changed to the power for advancing through the vessel wing. The submarine may move forwardly and downwardly with a certain angle. When the submarine reaches to the boundary of safe depth, the elevating system of the submarine is operated and the water within the tank is drained into the outer water bags. At this time, the water bags expand, and the specific gravity of the submarine reduces. When the specific gravity is smaller than the specific gravity of water, the submarine buoys up, and the buoyancy may be changed into a power for advancing through vessel wing. At this time, the angle of elevator is adjusted through operating rod of the elevator, so that the submarine may move upwardly and forwardly with a certain angle, until the submarine

buoys out of water surface. If the submarine is not requested to buoy out of water surface, after the submarine reaches a certain height, the water within the outer water bags may be drained into the inside water tank again to repeat previous submerging process, with such draining reciprocally, the submarine will advance under the water like a letter "Z" shape.

While specific gravity of the submarine equals to that of water, the submarine is in a relative stable condition in the water. At this time, the submarine may advance either with the aid of a storage battery or an electrical motor or with the aid of a foot operated propeller. At this time, the movement direction of the submarine may be controlled with the aid of an elevator and a vertical rudder.

If necessary, the submarine may buoy over water, and the sail wing is raised, so that the submarine advances by wind power and/or the storage battery may be charged by a wind generator.

At the center of the sail there is a rounded hole, of which the periphery frame is made of rigid material. Such sail wing structure has two functions: firstly, when sail wing is used under water as a vessel wing, the rounded hole is aligned with the observing window of submarine, so as to ensure the normal work of observing window; secondly; when sail wing is used over water as a sail, a wind power generator is installed within the hole, so as to use collection-wind effect of the sail wing, and smaller

diameter of fan blades to obtain larger generating power.

Since its living space is narrow for the present submarine, its independent living environment is worse in the sea, and it requires that it have to utilize all the available space fully. Therefore, the system used for controlling submarine elevating is relative closed, and the working liquid may be fresh water. When submarine is equipped with a filtering-desalination device for seawater and a compact electrical generator, part of fuel can be stored in the relatively independent space within the water tank.

In order to increase buoying and traveling speed, the elevating water bags 3 also can be eliminated or not be used while installed. During sinking down, seawater is filled into the inside water tank directly, and during buoying up, the water within the inside water tank is drained into the sea directly.

Since above mentioned technical solution is adopted, the present submarine has features of flexible operation, excellent driving efficiency and speed, and extremely concealed performance (extremely low noise). Therefore, the marine of the invention can be practically used in sea-bottom exploring, traveling and sight seeing etc., and it also can be used in military object in certain circumstance.

Description of drawings

The invention will be explained in detail with reference to the embodiments accompanied by the following drawings, wherein,

Fig.1 is an elevation view of structural scheme of the submarine driven by multimedia;

Fig.2 is a top view of structural scheme of the submarine driven by multimedia;

Fig.3 is a side view of structural scheme of the submarine driven by multimedia;

Fig.4 is a scheme of the submarine during being driven or generating electricity by sail wing over water;

Fig.5 shows the elevating control principle of the glide submarine.

List of elements and parts

The following is a list of elements and parts: 1- vessel body, 2-elevator, 3-elevating water bags, 4-both hole for supplying oxygen and drawing point; 5-both vessel door and observing window, 6-vertical tail plane, 7-multifunction sail wing, 8-propeller, 9- bolt for fixing the sail wing, 10-supporting rod at the top end of the sail wing, 11-supporting rod of the sail wing, 12-both angle control wheel of the sail wing and accessing point to vessel body for the control rope of the sail wing, 13-angle control rope of the sail wing, 14- supporting rod at the bottom end of the sail

wing, 15- bolt for fixing the adjustable sail wing, 16-elevating control rope of the sail wing, 17-both collision-avoidance point and wheel for transmitting and fixing the control rope, 18-flexible fixing rope for the sail wing, 19-rudder, 20-angle control wheel for the sail wing, 21-elevating control wheel for the sail wing, 22-manual driving system, 23-high pressure resistant inside water tank, 24-internal combustion engine or electrical motor clutch coupling and driver, 25-both thrust bearing and shaft seal, 26-integrated diesel oil engine and electrical generator driving system, 27-fuel battery or storage battery system, 28-wind power generator, 29-high-pressure oxygen bottle, 30-air filled valve, 31-water bag draining valve, 32- foot paddle for the plunger cylinder, 33-foot paddle linkage rod, 34-plunger cylinder, 35-one way draining valve for the water tank, 36-one way valve, 37-snbmerging control valve, 38-draining valve for the water tank , 39-air inlet valve, 40-parallel connecting electric pumps operated submarine elevating system, 41-over pressure protecting air filled valve for the submarine.

Embodiment

As shown in the drawings, the work principle of the submarine is as follows: the inside water tank 23, the outside elevating water bags 3, the foot-actuating draining plunger cylinder 34, and various valves and manifolds form a closed system connected through corresponding

manifolds. Parallel connecting electric pumps operated submarine elevating system 40 is connected in parallel to the closed system through corresponding manifolds, so that elevating of submarine can be controlled either manually or by machinery. When the submarine is over water, water or air is filled into the elevating water bags 3, and the submarine is in an over-water operation condition or a semi-underwater operation condition. At this time, the sail wing 7 could be raised by operating the sail wing sail wing angle control wheel 20 and the sail wing elevating control wheel 21, and a windward angle of the sail wing is adjusted, so as to advance the submarine by wind power (see Fig.4). When the submarine is over water, the transmission shaft of the propeller and therefore the propeller 8 can be rotated with the aid of a foot operated wheel disc arranged in the manual driving system 22 through a transmission chain, a flying wheel, a positive and negative rotating clutch coupling etc., so as to drive submarine to advance. If necessary, the above-mentioned two driving modes could be used simultaneously.

When submarine is going to be changed into an underwater operation condition, the submerging control valve 37 is opened. Since the pressure of water within the outer elevating water bags 3 during normal condition is always larger than the pressure of water in the inside water tank 23, at this time, the water within the outer water bags 3 flows into the inside water tank 23, the outer water bags 3 contract, the drain volume of the

submarine reduces gradually, and the submarine sinks gradually. When the drain volume of the submarine is reduced to a certain degree, the specific gravity of the vessel body is larger than that of water, and the submarine may sink down. At this time, the valve is closed, and the operating rod of the elevator is pulled and the angle of elevator 2 is adjusted, then the submarine will move downwardly and forwardly with a certain angle. When the submarine reaches to a boundary of safe depth, the parallel connecting electric pumps operated submarine elevating system 40 is operated or the plunger cylinder foot paddle 32 is treaded to cause the plunger cylinder 34 to work. The water within the water tank 23 is drained into water bags 3 through the water tank one-way draining water valve 35 and the one-way valve 36. At this time the water bags 3 expand, the specific gravity of the submarine reduces gradually. When the specific gravity is smaller than that of water, the submarine buoys up. At this time, the angle of elevator 2 is adjusted, so that the submarine could be moved upwardly and forwardly with a certain angle, until it buoys out of water surface. If the submarine is not requested to be buoyed out of water surface, after the submarine reaches to a certain height, the water within the water bags 3 may be drained into the water tank again, and the above-mentioned submerging process is repeated. Such a reciprocal water-filling and draining procedure causes the submarine moving forwardly underwater as a letter "Z" shape.

When the specific gravity of the submarine equals to that of water, the submarine is in a relative stable condition in water. At this time, the submarine may be driven by either of the electric motor or the storage battery system, or the manual system to move forwardly and the movement direction may be controlled by the elevator 2 and the rudder 19.

Fig.5 shows the elevating control principle of the glide submarine. During submarine sinking down, the submerging control valve 37 is opened, and the water within the elevating water bags 3 flows into the inside water tank 23, then the water bags 3 contract, and the specific gravity of submarine increases gradually. When the specific gravity of submarine is larger than that of water, the submarine produces gravity for moving downwardly. The amount of the gravity is determined by the specific gravity of the submarine. During the submarine buoying up, the plunger cylinder foot paddle 32 is treaded to cause the plunger cylinder 34 to work, so that the water within the water tank 24 is drained into the elevating water bags 3 through the water tank one-way draining valve 35, the plunger cylinder 34 and the one-way valve 36. At this time, the water bags 3 expand gradually, and the specific gravity of submarine reduces gradually. When the specific gravity is smaller than that of water, the submarine starts to buoy up. When it is necessary to fill air into the elevating water bags 3, the air inlet valve 39 is opened, and the plunger

cylinder foot paddle is treaded, the plunger cylinder works and then air can be filled into the elevating water bags 3. The above-mentioned working step can also be completed by operating the parallel connecting electric pumps operated submarine elevating system 40. Therefore, the elevation of the submarine can be controlled manually or by machinery. The over-pressure protecting air-filled valve 41 of the submarine is connected with corresponding machinery and electrical protecting component, and its function is: when the submarine reaches to submerging limit while the operator does not adopt corresponding provision, this valve is opened, the water in the high pressure resistance inside water tank 23 is forced to drain out of the vessel, so as to buoy the submarine up. If this operation is inefficiency, then the air is filled in the outer elevating water bags 3 through the air filled valve 30 directly, so that the submarine is forced to buoy up, ensuring safe of the crew in the vessel.

During submarine's moving and anchoring over water, the multifunction sail wing could be hoisted, and the electrical generator is mounted, so as to use rich wind power resource on the sea to charge the storage battery. At this time, the multifunction sail wing is used as a wind power collector, which can increase the wind pressure of the wind fan of the electrical generator largely, so as to obtain larger power of electrical generator.

The electrical generator is a multi function and disassemble one, either

can be used as a wind electrical power generator when wind fan blade is installed and fixing in multi functions sail wing on water surface; or can be used as a normal electrical generator mating with diesel oil engine inside vessel.